

The genus *Dinotrema* Foerster, 1863, in the Païolive ecocomplex caves (Southern France) (Hymenoptera, Braconidae, Alysiinae)

by Francisco Javier PERIS-FELIPO¹ & Henri-Pierre ABERLENC²

¹ Bleichestrasse 15, CH – 4058 Basel, Suisse <peris.felipo@gmail.com>

² 65 boulevard Peschaire-Alizon, F – 07150 Vallon-Pont-d’Arc <desetoiles8161@orange.fr>

Abstract. – First record of genus *Dinotrema* Foerster, 1863, from two French caves in the Païolive ecocomplex and first record of *Dinotrema cavernicola* Peris-Felipo, 2014, from France are provided.

Résumé. – Le genre *Dinotrema* Foerster, 1863, dans l’écocomplexe des grottes de Païolive (Hymenoptera, Braconidae, Alysiinae). Les premières observations dans deux grottes françaises du genre *Dinotrema* Foerster, 1863, et la première citation en France de *Dinotrema cavernicola* Peris-Felipo, 2014, sont rapportées.

Keywords. – Parasitoid wasps, taxonomy, caves, troglophilous species, Païolive, Mediterranean area.

Mediterranean forest landscapes are rich in evergreen species that frequently intersect with areas of brushwood, pasture, farming and ranching. In close proximity to these areas, however, it is often possible to identify zones that have regained their highly diverse natural communities after cessation of human intervention. This favours the proliferation of hotspots in Mediterranean ecosystems (MYERS *et al.*, 2000). Despite the huge resistance posed by Mediterranean biotopes to human pressure, isolation and fragmentation are unavoidable (PUNGETTI, 2003), resulting in the emergence of isolated patches within the landscape.

The Païolive and Gras ecocomplex has an extension of 150 km². It is considered as a biodiversity peak and is defined as the southern part of the karstic Gras plateau (Upper Jurassic and Berriasian limestones) in Ardèche and Gard departments in the northern border of the French Mediterranean area, where lives a population of *Eupotosia mirifica* (Mulsant, 1842) (Coleoptera, Cetoniidae) (ABERLENC, 2016) (fig 1). The climate present on the area is supra-mediterranean.

Several works have been carried out in the Païolive ecocomplex to catalogue the arthropods fauna (ABERLENC & LENTENOIS, 2003; ABERLENC *et al.*, 2003; TASSI *et al.*, 2004; ABERLENC, 2006, 2008). Recently, ABERLENC (2016) recorded a total of 116 subterranean arthropods species belonging to nine classes and 55 families. Moreover, Païolive Association is carrying out a large project to know all the biodiversity in the ecocomplex. Thanks to this study, many species have been sampled, such as alysiine parasitoid wasps (Braconidae) belonging to the genus *Dinotrema* Foerster, 1863.

Dinotrema is one of the largest genera in the tribe Alysiini (Alysiinae) whose species are parasitoids of the larvae of Diptera predominantly belonging to the family Phoridae (ACHTERBERG, 1988). This genus comprises hundreds of species described from all zoogeographical regions (PERIS-FELIPO & BELOKOBYLSKIY 2016a, b). However, only *Dinotrema cavernicola* Peris-Felipo, 2014, was recorded before from the subterranean systems of the “Sistema de la Murcielaguina” and “Sima de La Colada” (Jaén, Spain) at 35 and 65 m depth, respectively.

To date, four specimens of *Dinotrema* have been collected in the Païolive ecocomplex. One unknown species was sampled from the Baume du Pêcher cave and three specimens were captured from the Baume-Grenas cave. These three specimens belong to *D. cavernicola* (fig. 2), and were collected by aspirator at 50 and 75 m from the entrance of the cave (fig. 1D). This

cave is a subhorizontal and slightly sinuous gallery with approximately 130 m of length. It has a northeastern orientation and several lateral small diverticula. The cave entrance is close to the bottom of thalweg with a dominance of *Quercus pubescens* Mill. and *Buxus sempervirens* L., among others.

Identification was carried out using the keys to species of Western Palaearctic *Dinotrema* by PERIS-FELIPO *et al.* (2014a, b). The material examined is deposited in the collection of the Naturhistorisches Museum Basel (NHMB) and in H.-P. Aberlenc's collection (HPAC). Information on the labels is as follows:

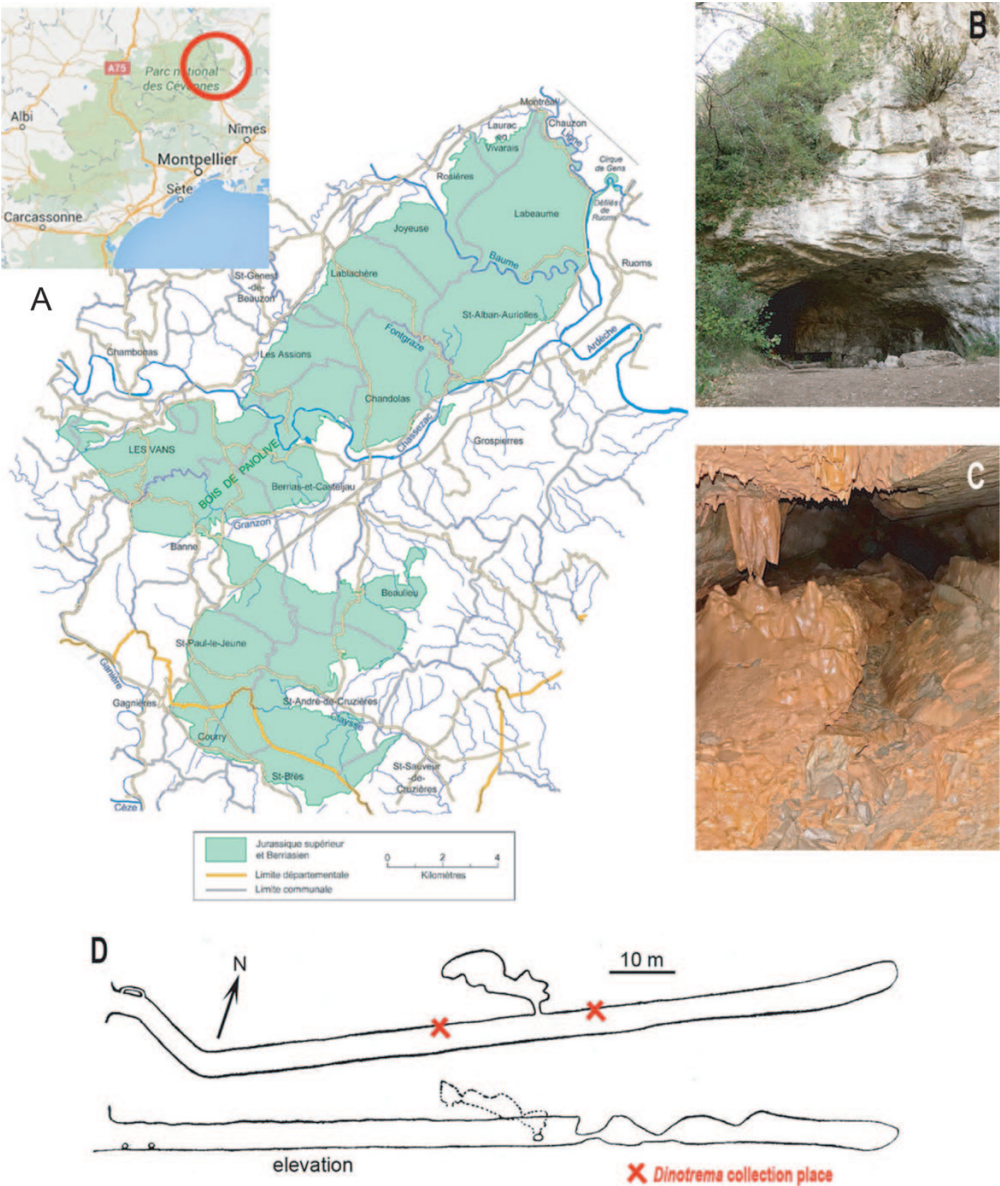


Fig. 1. – Païolive ecocomplex. A, Distribution of studied caves (Maurice Lhomme map); B, Baume-Grenas cave entrance; C, Baume du Pêcher cave; D, Schematic topography of the Baume-Grenas cave (adapted from BALAZUC, 1956) with crosses where *Dinotrema* Foerster were found.

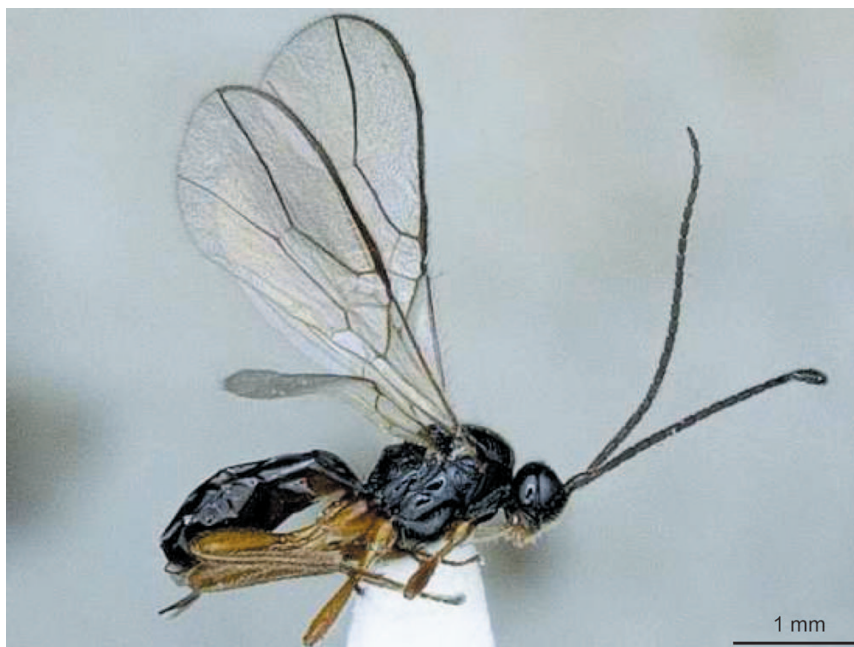


Fig. 2. – *Dinotrema cavernicola* Peris-Felipo, ♀ sampled from Baume-Grenas cave, lateral habitus.

– *Dinotrema cavernicola*: 1 ♀, France, Ardèche, Païolive, Ruoms, Baume-Grenas, UTM WGS 84 606442 E - 4925339N, 18.VIII.2015 (*H.-P. Aberlenc leg.*) (NHMB); 2 ♀, same locality but, 44°28'25.07"N - 4°20'17.40"E, 11.X.2015, one specimen swept on spider net (*H.-P. Aberlenc leg.*) (HPAC).

– *Dinotrema* sp.: 1 ♀, France, Ardèche, Païolive, Labeaume, Baume du Pêcher, UTM WGS 84 605570 E - 4926143 N, 18.VIII.2015 (*H.-P. Aberlenc leg.*) (NHMB).

All *Dinotrema* were sampled in complete darkness together with specimens of *Megaselia rufipes* (Meigen, 1804) and *Triphleba antricola* (Schmitz, 1918) (Diptera, Phoridae) and *Eccoptomera* sp. (Diptera, Heleomyzidae). Phoridae specimens were determined by Henry Disney while Heleomyzidae specimens were determined by Michel Martinez. Similar situation happened in Spain where *Dinotrema cavernicola* was found with specimens of Phoridae such as *Megaselia rufipes* and *M. tenebricola* Schmitz, 1934, and Heleomyzidae such as *Heteromyza atricornis* (Meigen, 1830) (PERIS-FELIPO *et al.*, 2014a).

To conclude, this discovery provides the first record of this genus and species in French caves. Also, new data distribution and hosts of the subterranean wasp species *D. cavernicola* are provided. However, additional taxonomic studies are necessary to increase the knowledge of diversity and applicability of parasitoid wasps on Dipteran control.

ACKNOWLEDGEMENTS. – We are very thankful to Isabelle Zuecker, Matthias Borer and Daniel Burckhardt, Naturhistorisches Museum Basel, Switzerland, for their kindness and help during our use of their photosystem. We also want to thank to Maurice Lhomme for providing us maps, Sergey Belokobylskij for helping us with taxonomy, and Henry Disney and Michel Martinez for the identification of the flies.

REFERENCES

- ABERLENC H.-P., 2006. – La grande Cétoine bleue, Graal du patrimoine naturel de Païolive. *La Viste*, 19 : 42-48.
 — 2008. – Les Insectes du Bois de Païolive : premier supplément à l'inventaire. *Cahiers de Païolive*, 1 : 256 p. + 32 pl.

- ABERLENC H.-P., 2016. – Les Arthropodes souterrains de l'écocomplexe de Païolive et des Gras. *Cahiers de Païolive*, **2** : 19-62.
- ABERLENC H.-P., CURLETTI G., DUTTO M. & TASSI F., 2003. – *Eupotosia mirifica*, joyau menacé du patrimoine naturel européen (Coleoptera, Cetoniidae). In : Mason F., Nardi G. & Tisato M. (eds), Proceedings of the International Symposium "Dead Wood: a key to biodiversity", Mantova, 2003, May 29th-31st. *Sherwood*, **95** (2) : 69-72.
- ABERLENC H.-P. & LENTENOIS P., 2003. – Les Insectes du Bois de Païolive. In : Holthof J. F. & Schnetzler J. (eds), De Saint-Eugène en Païolive. Montmélian et les Vans, La Fontaine de Siloé et Saint-Eugène en Païolive, 320 p.
- ACHTERBERG C. VAN, 1988. – The genera of the *Aspilota*-group and some descriptions of fungicolous Alysiini from the Netherlands (Hymenoptera: Braconidae: Alysiinae). *Zoologische Verhandelingen*, **247** : 1-88.
- BALAZUC J., 1956. – *Spéléologie du Département de l'Ardèche*. Como : Rassegna Speleologica Italiana e Societa Speleologica Italiana, 158 p. + 62 pl. + 1 map.
- MYERS N., MITTERMEIER R. A., MITTERMEIER C. G., FONSECA G. A. B. & KENT J., 2000. – Biodiversity hotspots for conservation priorities. *Nature*, **403** : 853-858. doi: 10.1038/35002501.
- PERIS-FELIPO F. J. & BELOKOBYLSKIJ S. A., 2016a. – First record of the genus *Dinotrema* Foerster, 1862 (Hymenoptera, Braconidae, Alysiinae) from the Neotropical region with description of four new species and a key to the New World taxa. *European Journal of Taxonomy*, **179** : 1-23. doi: 10.5852/ejt.2016.179.
- 2016b. – Afrotropical species of the genus *Dinotrema* Foerster 1862 (Hymenoptera, Braconidae, Alysiinae) with description of three new taxa and a key for determination. *Bulletin of Insectology*, **69** (1) : 93-106.
- PERIS-FELIPO F. J., BELOKOBYLSKIJ S. A., ACHTERBERG C. VAN & PÉREZ-FERNÁNDEZ T., 2014a. – *Dinotrema cavernicola* sp. n. (Hymenoptera, Braconidae, Alysiinae), a new species of the genus *Dinotrema* Foerster from caves of Spain. *Journal of Hymenoptera Research*, **41** : 47-56. doi: 10.3897/JHR.41.8606.
- PERIS-FELIPO F. J., BELOKOBYLSKIJ S. A. & JIMÉNEZ-PEYDRÓ R., 2014b. – Revision of the Western Palaearctic species of the genus *Dinotrema* Foerster, 1862 (Hymenoptera, Braconidae, Alysiinae). *Zootaxa*, **3885** (1) : 1-483. doi: 10.11646/zootaxa.3885.1.1.
- PUNGETTI G., 2003. – Diseño ecológico del paisaje. Planificación y conectividad en el mediterráneo y en Italia (p. 111-124). In : García Mora M. R. (ed.), *Conectividad ambiental: las áreas protegidas en la Cuenca mediterránea*. Junta de Andalucía, Spain.
- TASSI F., ABERLENC H.-P., RASPLUS J.-Y., CURLETTI G., DUTTO M., GENSON G. & LEMPÉRIÈRE G., 2004. – *Eupotosia mirifica*, la grande Cétoine bleue, joyau menacé du patrimoine naturel européen. Propositions pour la protection de l'espèce et de ses biotopes (Coleoptera Cetoniidae Cetoniinae). *Lambillionea*, **104** (1) : 1-32.
-